

MISSION SUPPORT

FY 2002 ESTIMATES

RESEARCH AND PROGRAM MANAGEMENT

PROGRAM GOALS

The primary goal of this budget segment is to acquire and maintain a civil service workforce which reflects the cultural diversity of the Nation and, along with the infrastructure, is sized and skilled consistent with accomplishing NASA's research, development, and operational missions with innovation, excellence, and efficiency. The budget proposed is constructed to achieve that goal. In accordance with the two-appropriation approach, the R&PM funds for FY 2002, displayed here for information purposes only, are allocated in the HSF and SAT accounts against the appropriate Enterprises. This allocation is based on the distribution of the direct full time equivalent (FTE) people associated with each Enterprise, along with a share of other than direct R&PM funds allocated using the relative percentages of direct FTE's by Enterprises. These funds will be identified within each Enterprise section under the title of "Institutional Support".

Beginning in FY 2002, there will no longer be a Mission Support account. Institutional costs will be budgeted within HSF and SAT (as discussed above) and Safety, mission assurance and engineering will be budgeted within the HSF account.

STRATEGY FOR ACHIEVING GOALS

This civil service workforce is the underpinning for the successful accomplishment of the Nation's civil aeronautics and space programs. These are the people who plan the programs; conduct and oversee the research; select and monitor the contractors; manage the various research, development, and test activities; and oversee all of NASA's operations. A key dimension of the reinvention of NASA has been the restructuring of the civil service workforce to deliver a space and aeronautics program that is balanced, relevant, and at the forefront of technology development.

During FY 2000, NASA recognized the need to strengthen the workforce in critical areas and renewed its focus on the restructure and revitalization of the NASA workforce. The halt in the influx of new college graduates as a result of years of downsizing, has skewed the age distribution of NASA's workforce. In FY 2002, NASA plans to develop an initiative to enhance Centers' recruitment capabilities, focusing on hiring freshouts. Additionally, beginning in FY 2000, the Agency embarked upon a strategy to accomplish work through a balance of permanent civil servants, time-limited civil service appointees, and individuals from the academic world who contribute through post-doctoral fellowships, grants programs, or on Intergovernmental Personnel Act assignments. The focus of this effort is to draw from a variety of sources to ensure the effective use of talent both within and outside the Agency. The use of non-permanent civil servants, where it makes sense, can be a means to infuse the NASA workforce with fresh ideas and allow the Agency to make changes quickly and efficiently, with minimal adverse impact on the core workforce. As part of our human capital investment strategy, we are working to attract and retain a world-class workforce with the necessary skills and competencies. We

also encourage continual learning – including emphasis on technical training, leadership development, and career management. In recent years, NASA has placed a renewed emphasis on academic education and maintenance of leading edge and technical state of the art skills – on developing an environment conducive to life-long learning. In addition to funding more university level courses, the Agency has made a strong investment in ensuring NASA participation in conferences and symposia, where breakthrough research and ideas are being presented and shared, as well as providing training in safety, ISO 9001, information technology, and core functional areas.

In FY 2001, NASA will undertake a review of Critical Capabilities. U. S. academia and industry provide a rich R&D resource that NASA can tap to strengthen its mission capabilities. NASA will develop an integrated, long-term agency plan that ensures a national capability to support NASA's mission by: 1) identifying NASA's critical capabilities and, through the use of external reviews, determining which capabilities must be retained by NASA and which can be discounted or led outside the agency; 2) expanding collaboration with industry, universities and other agencies and outsourcing appropriate activities to fully leverage outside expertise; and 3) pursuing civil service reforms for capabilities that NASA must retain, to ensure recruitment and retention of top science, engineering and management talent at NASA.

Since FY 2000, the Agency has focused additional emphasis on "just in time" training and coaching opportunities provided to project leader and team members to improve project team competencies. In addition, NASA has updated its leadership model specifying the latest cutting edge skills and behaviors required for effective leadership. Additional resources have been provided for in the FY 2002 Agency budget to enable NASA to expand the delivery methods being utilized to develop the workforce. Specific emphasis will be placed on the development of e-learning alternatives that can be accessed at all locations and levels, and increasing the ability to expand participation levels across the Agency. In addition, new capabilities are being developed to facilitate learning within intact teams; delivering tailored content directly to a project team at the point in time specific training is needed. NASA is also engaged in a strategy to develop employees in the theories, methods and tools of learning organizations. Pilots are showing that these skills enhance motivation, communication, and understanding of complex systems.

Research and Program Management Budget

The Research and Program Management (R&PM) program provides the salaries, other personnel and related costs, travel and the necessary support for all of NASA's administrative functions and other basic services in support of research and development activities at NASA installations. The salaries, benefits, and supporting costs of this workforce comprise approximately 78% of the requested funding. Administrative and other support is 20% of the requests. The remaining 2% of the request is required to fund travel necessary to manage NASA and its programs.

The FY 2002 budget estimate of \$2,460.5 million for Research and Program Management represents an increase of \$185.1 million from the FY 2001 budget plan of \$2,275.4 million. Of this total increase, Personnel and related costs increase by \$99.9 million from FY 2001 to FY 2002. These increases fully fund the civil service workforce, the full year cost of the 2001 payraise, the payraise projected to be effective in January 2002, increased costs of health care, normal salary growth and an increase in training. Travel represents a slight increase of \$1.5 million over the FY 2001 budget plan due to increased requirements for Space Station. Research Operations Support increases by \$83.7 million from the FY 2001 budget plan of \$426.0 due to transfers out of Program into ROS for

Institutional funding items, an augmentation to the Headquarters Operations budget for the CIO Initiatives, Implementation of a Counter Intelligence Program, Scientific and Technical Upgrades, projected rent increases and an increase for IFMS. The IFMS increase reflects the continued high level of activity planned for the implementation of the Integrated Financial Management System (IFMS). Award of this contract was made late in Fiscal Year 2000 and will encompass fourteen modules. Core Financial, Procurement Management, Time and Attendance, Budget Formulation, Core Human Resources, Position Classification, Resume Management, Logistics, Travel Management, Environmental, Aircraft Management, Facilities, Payroll and Technical Refreshments. The overall implementation approach provides for a single contractor to work across all ten NASA centers to implement a single, integrated system. Centers will support the implementation contractor by providing guidance, data, and access to current systems.

FTE levels that were included in Program Operations (which were mostly Center Management and Operations) in prior R&PM FTE allocations, are now included in Institutional Support in the Enterprise summaries for each Center.

In summary, the FY 2002 proposed budget of \$2,460.5 million will provide for 18,237 full-time permanent civil service workyears, and 18,792 FTE civil service workyears (not including the NASA Office of Inspector General) to support the activities at nine NASA Installations and Headquarters. NASA plans to control personnel levels through full time permanent (FTP) civil servant workyears while continuing to track full-time equivalent workyears, as done in the past. This will allow NASA more flexibility in the use of non-permanent positions for short-term technical needs as well as co-op and intern programs.

The following describes, in detail, the cost elements within this program.

I. Personnel and Related Costs

A. Compensation and Benefits

1. Compensation

- a. Permanent Positions: This part of Personnel and Related Costs covers the salaries of the full-time permanent civil service workforce and is the largest portion of this functional category.
- b. Other Than Full-Time Permanent Positions: This category includes the salaries of NASA's non-permanent workforce. Programs such as Presidential Management Interns, students participating in cooperative training, summer employment, youth opportunity, and temporary clerical support are covered in this category.
- c. Reimbursable Detailees: In accordance with existing agreements, NASA reimburses the parent Federal organization for the salaries and related costs of persons detailed to NASA.
- d. Overtime and Other Compensation: Overtime, holiday, post and night differential, and hazardous duty pay are included in this category. Also included are incentive awards for outstanding achievement and superior performance.

- 2. Benefits: In addition to compensation, NASA, as authorized and required by law, makes the employer's contribution to personnel benefits. These benefits include contributions to the Civil Service Retirement Fund, the Federal Employees Retirement System, employees' life and health insurance, payments to the Medicare fund for permanent employees, and social security contributions. Payments to the civil service retirement fund for re-employed annuitants and severance pay to former employees involuntarily separated through no fault of their own are also included.

B. Supporting Costs

- 1. Transfer of Personnel: Provided under this category are relocation costs required by law, such as the expenses of selling and buying a home, subsistence expenses, and the movement and storage of household goods.

2. Investigative/Other Services: The Office of Personnel Management is reimbursed for activities such as security investigations of new hires and revalidation of sensitive position clearances. In addition, this category pays for, recruitment advertising, and materials, personnel/workforce studies and Federal wage system surveys.
3. Personnel Training: Training is provided within the framework of the Government Employees Training Act of 1958. Part of the training costs is for courses offered by other Government agencies, and the remainder is for training through nongovernment sources.

II. Travel

- A. Program Travel: The largest part of travel is for direction, coordination, and management of program activities including international programs and activities. The complexity of the programs and the geographical distribution of NASA Installations and contractors necessitate this category of travel. As projects reach the flight stage, support is required for prelaunch activities including overseas travel to launch and tracking sites. The amount of travel required for flight projects is significant as it is directly related to the number of systems and subsystems, the number of design reviews, and the number and complexity of the launches and associated ground operations.
- B. Scientific and Technical Development Travel: Travel to scientific and technical meetings and seminars permits employees engaged in research and development to participate in both Government sponsored and nongovernment sponsored activities. This participation allows personnel to benefit from exposure to technological advances, which arise outside NASA, as well as allowing personnel to present both accomplishments and problems to their associates and provides for the dissemination of technical results to the United States community.
- C. Management and Operations Travel: Management and operations travel provides for the direction and coordination of general management matters and travel by officials to review the status of programs. It also includes travel by functional managers in such areas as personnel, financial management, and procurement. This category also includes the cost of travel of unpaid members of research advisory committees; and initial duty station, permanent change of assignment, and related travel expenses.

III. Research Operations Support

- A. Facilities Services: Facilities Services provides basic security, fire protection, and other custodial services. It also provides maintenance of roads and grounds and of all administrative buildings and facilities. Finally, it provides rental of administrative buildings and all utility costs of administrative buildings.

- B. Technical Services: Technical Services provides the Administrative Automatic Data Processing capability that supports Accounting, Payroll, Budgeting, Procurement, and Personnel as well as all the other Administrative functions. It also funds the Graphics and Photographic support to these functions. Finally, it funds the Installation-wide safety and public information programs.
- C. Management and Operations: Management and Operations funds the telephone, mail, and logistics systems, the administrative equipment and supplies, and the transportation system including the general purpose motor pools and the program support aircraft. It also funds the basic medical and environmental health programs. Finally, it funds printing and reproduction and all other support, such as small contract and purchases for the Center Directors staff and the Administrative functions.

SUMMARY OF BUDGET PLAN BY FUNCTION
(Thousands of Dollars)

	FY 1999 OP PLAN <u>REVISED</u>	FY 2000 OP PLAN <u>REVISED</u>	FY 2001 PRES <u>BUDGET</u>
PERSONNEL AND RELATED COSTS	\$1,675,969	\$1,796,340	(\$1,896,200)
TRAVEL	\$49,975	\$53,083	(\$54,600)
RESEARCH OPERATIONS SUPPORT	<u>\$473,800</u>	<u>\$425,952</u>	<u>(\$509,700)</u>
TOTAL PROGRAM PLAN	<u>\$2,199,744</u>	<u>\$2,275,375</u>	<u>(\$2,460,500)</u>

DETAIL OF BUDGET PLAN BY FUNCTION
(Thousands of Dollars)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
I. Personnel and related costs	<u>\$1,675,969</u>	<u>\$1,796,340</u>	<u>(\$1,896,200)</u>
<u>A. Compensation and benefits</u>	<u>\$1,615,175</u>	<u>\$1,735,528</u>	<u>(\$1,820,266)</u>
1. Compensation	\$1,325,809	\$1,434,025	(\$1,501,372)
2. Benefits	\$289,366	\$301,503	(\$318,894)
<u>B. Supporting costs</u>	<u>\$60,794</u>	<u>\$60,812</u>	<u>(\$75,934)</u>
1. Transfer of personnel	\$10,201	\$8,637	(\$7,995)
2. Investigative services	\$2,710	\$1,888	(\$2,817)
3. Personnel training	\$47,883	\$50,287	(\$65,122)
 II. Travel	 <u>\$49,975</u>	 <u>\$53,083</u>	 <u>(\$54,600)</u>
A. Program travel	\$30,630	\$32,560	(\$33,470)
B. Scientific and technical development travel	\$6,910	\$7,340	(\$7,545)
C. Management and operations travel	\$12,435	\$13,183	(\$13,585)
 III. Research operations support	 <u>\$473,800</u>	 <u>\$425,952</u>	 <u>(\$509,700)</u>
A. Facilities services	\$132,100	\$126,252	(\$135,700)
B. Technical services	\$203,800	\$154,700	(\$214,439)
C. Management and operations	\$137,900	\$145,000	(\$159,561)
 Total	 <u>\$2,199,744</u>	 <u>\$2,275,375</u>	 <u>(\$2,460,500)</u>

DISTRIBUTION OF BUDGET PLAN BY FUNCTION BY INSTALLATION
(Thousands of Dollars)

FUNCTION	TOTAL NASA	JSC	KSC	MSFC	SSC	GSFC	ARC	DFRC	LARC	GRC	JPL	HQS
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PERSONNEL AND RELATED COSTS

FY 2000	1,675,969	291,345	154,770	235,495	22,325	289,375	145,506	53,361	198,072	170,425		115,295
FY 2001	1,796,340	312,134	166,503	250,888	24,165	307,890	152,690	57,448	211,069	180,041		133,512
FY 2002	1,896,200	325,695	176,599	262,591	25,286	318,373	162,344	58,153	219,483	183,120		164,556

TRAVEL

FY 2000	49,975	9,056	4,316	7,259	745	7,747	3,967	1,579	5,107	3,848		6,351
FY 2001	53,083	8,958	5,519	6,330	758	7,473	3,701	1,472	4,994	3,977		9,901
FY 2002	54,600	8,750	5,400	6,300	700	7,479	3,700	1,400	4,900	3,900		12,071

RESEARCH OPERATIONS SUPPORT

FY 2000	473,800	39,853	91,673	69,467	21,300	77,828	32,712	6,548	28,006	25,779	399	80,235
FY 2001	425,952	44,928	75,649	69,412	18,699	61,124	35,651	4,770	21,177	26,206	270	68,066
FY 2002	509,700	46,441	77,844	62,119	22,330	61,230	33,967	4,900	29,746	28,101	300	142,722

TOTAL

FY 2000	2,199,744	340,254	250,759	312,221	44,370	374,950	182,185	61,488	231,185	200,052	399	201,881
FY 2001	2,275,375	366,020	247,671	326,630	43,622	376,487	192,042	63,690	237,240	210,224	270	211,479
FY 2002	2,460,500	380,886	259,843	331,010	48,316	387,082	200,011	64,453	254,129	215,121	300	319,349

SUMMARY OF BUDGET PLAN BY INSTALLATION
(Thousands of Dollars)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
JOHNSON SPACE CENTER	\$340,254	\$366,020	\$380,886
KENNEDY SPACE CENTER	\$250,759	\$247,671	\$259,843
MARSHALL SPACE FLIGHT CENTER	\$312,221	\$326,630	\$331,010
STENNIS SPACE CENTER	\$44,370	\$43,622	\$48,316
GODDARD SPACE FLIGHT CENTER	\$374,950	\$376,487	\$387,082
AMES RESEARCH CENTER	\$182,185	\$192,042	\$200,011
DRYDEN FLIGHT RESEARCH CENTER	\$61,488	\$63,690	\$64,453
LANGLEY RESEARCH CENTER	\$231,185	\$237,240	\$254,129
GLENN RESEARCH CENTER	\$200,052	\$210,224	\$215,121
HEADQUARTERS	\$201,881	\$211,479	\$319,349
JET PROPULSION LABORATORY	<u>\$399</u>	<u>\$270</u>	<u>\$300</u>
AGENCY TOTAL	<u>\$2,199,744</u>	<u>\$2,275,375</u>	<u>\$2,460,500</u>

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY INSTALLATION

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Johnson Space Center	2,929	3,036	3,021
Kennedy Space Center	1,740	1,825	1,835
Marshall Space Flight Center	2,576	2,758	2,785
Stennis Space Center	272	280	300
Goddard Space Flight Center	3,288	3,311	3,316
Ames Research Center	1,451	1,464	1,486
Dryden Flight Research Center	617	635	609
Langley Research Center	2,360	2,396	2,364
Glenn Research Center	1,970	1,973	1,922
Headquarters	<u>980</u>	<u>1,063</u>	<u>1,154</u>
Total, full-time equivalents	<u>18,183</u>	<u>18,741</u>	<u>18,792</u>

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>7,416</u>	<u>7,779</u>	<u>8,092</u>
International Space Station	2,340	2,396	2,573
Space Operations (SOMO)	353	352	356
Space Flight Operations (Space Shuttle)	1,783	1,968	1,998
Payload & ELV Support	280	306	319
Investment - HEDS	733	737	747
HEDS Mission Support	1,927	1,990	2,069
HEDS Reimbursable Activities	0	30	30
SPACE SCIENCE	<u>2,489</u>	<u>2,221</u>	<u>2,314</u>
Major Development Programs	328	302	257
Payloads Program	38	31	30
Explorer Program	180	180	185
Mars Surveyor Program	64	89	97
Discovery Program	17	18	22
Operating Missions	10	5	3
Research and Technology	1,069	870	914
Space Science Mission Support	783	726	803
BIOLOGICAL & PHYSICAL RESEARCH	<u>485</u>	<u>489</u>	<u>484</u>
Biological & Physical Research	382	372	362
B&PR Mission Support	103	117	122
EARTH SCIENCE	<u>1,976</u>	<u>1,816</u>	<u>1,733</u>
Earth Observing System Program	462	424	409
Earth Probes Program	152	99	76
Operating Missions	30	33	28
Research and Technology	597	546	556
Earth Science Mission Support	640	633	585
ES Reimbursable Activities	95	81	79

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM (continued)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
AERO-SPACE TECHNOLOGY	<u>5,713</u>	<u>6,305</u>	<u>6,033</u>
Aero-space Focused Programs	1,375	1,756	1,500
High Speed Research Program	1	0	0
Advanced Subsonics Tech Program	2	0	0
Aero-Space Base	2,582	2,337	2,294
Commercial Technology Program	205	219	223
Code R New Initiative	138	8	8
Space Base Program	0	313	292
Investment - AST	10	9	9
Aero-Space Technology Mission Support	1,400	1,663	1,707
SAFETY AND MISSION ASSURANCE	<u>66</u>	<u>87</u>	<u>87</u>
Safety and Mission Assurance	66	87	87
ACADEMIC PROGRAMS	<u>38</u>	<u>45</u>	<u>50</u>
 Total full-time equivalents (FTEs)	 <u>18,183</u>	 <u>18,741</u>	 <u>18,792</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

LYNDON B. JOHNSON SPACE CENTER

ROLES AND MISSIONS

SPACE STATION - The Johnson Space Center (JSC) has lead center management responsibility for the International Space Station (ISS) program. In addition, specific JSC technical responsibilities include development of a set of facilities and systems to conduct the operations of the Space Station including on-orbit control of the Space Station.

The Center also provides institutional personnel as well as engineering and testbed support to the Space Station program. This includes test capabilities, the provision of Government Furnished Equipment, and engineering analysis support for the work of the prime contractor, its major subcontractors, and NASA system engineering and integration efforts.

SPACE SHUTTLE - JSC has lead center management responsibility for the Space Shuttle. In addition, JSC will provide development, integration, and operations support for the Mission Control Center (MCC), the Shuttle Mission Simulator (SMS), and other ground facilities needed for Space Shuttle Operations. JSC will provide Space Shuttle operational flight program management including system integration, crew equipment modification and processing, crew training, flight mission planning and operations, and procurement of Orbiter hardware.

PAYLOAD AND UTILIZATION OPERATIONS - JSC will also conduct concept studies and development on flight systems and options for human transportation. JSC provides support to the engineering and technical base, payload operations and support equipment, and technology program support.

SPACE SCIENCE - JSC is responsible for leadership in the field of astromaterials and operates NASA's astromaterial curatorial facility for extraterrestrial sample materials. The Center supports the Agency's Space Science goals through research, information dissemination, and interaction with the scientific community. This research includes planetary science, astrobiology, space debris, and sample material handling. The primary focus is on the composition, structures, and evolutionary histories of astromaterials to further our understanding of the solar system and aid in the planning for future missions.

BIOLOGICAL AND PHYSICAL RESEARCH - JSC is the Lead Center for the following programs/functions: Biomedical Research and Countermeasures; Advanced Human Support Technologies; and Space Medicine. It also has a supporting role in the Microgravity Research program in biotechnology. As part of these activities, JSC will develop, coordinate and evaluate human physiological changes associated with the space flight environment and develop effective countermeasures to assure crew health and optimal performance during all phases of flight. Protection of flight crewmembers from the hazards of space radiation is one of NASA's highest priorities. A strategic plan for Space Radiation Health has been developed to acquire the knowledge necessary to predict radiation risks in space and to develop countermeasures that include advances at the cutting edge of modern technology. JSC will also define and develop on-board health care systems and environmental monitoring systems; crew medical training; ground-based medical support of missions; develop a longitudinal crew health data base; and develop medical and psychological crew selection criteria. The JSC has established a Center for the support of biotechnology applications in Microgravity in order to study growth factors, medical chemo/immunotherapeutic, and human tissue transplantation. The Center will integrate life science flight experiments for Spacehab and the ISS; operate integrated payload systems; and train mission specialists in the science aspects of their missions.

MISSION/SPACE COMMUNICATION SERVICES - The Space Operations Management Office (SOMO), manages the telecommunication, data processing, mission operation, and mission planning services needed to ensure that the goals of NASA's exploration, science, and research and development programs are met in an integrated and cost-effective manner. The SOMO also provides the administration and management of the Consolidated Space Operations Contract (CSOC).

CENTER MANAGEMENT AND OPERATIONS - Provides management, administrative, and financial oversight of NASA programmatic elements under JSC cognizance. In addition, the Center provides for the operation and maintenance of the institutional facilities, systems, and equipment. These functions are distributed under Institutional Support across the different Enterprises. JSC also coordinates the development of agency-wide foreign travel policy and processes all foreign travel.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
JOHNSON SPACE CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>2,748</u>	<u>2,815</u>	<u>2,800</u>
International Space Station	1,007	1,049	1,037
Space Operations (SOMO)	40	41	41
Space Flight Operations (Space Shuttle)	789	865	850
Investment - HEDS	324	324	335
HEDS Mission Support	588	536	537
SPACE SCIENCE	<u>45</u>	<u>60</u>	<u>60</u>
Mars Surveyor Program	8	2	0
Discovery Program	2	2	2
Operating Missions	3	3	3
Research and Technology	31	42	44
Space Science Mission Support	1	11	11
BIOLOGICAL & PHYSICAL RESEARCH	<u>110</u>	<u>130</u>	<u>130</u>
Biological & Physical Research	106	108	108
B&PR Mission Support	4	22	22
AERO-SPACE TECHNOLOGY	<u>20</u>	<u>23</u>	<u>23</u>
Aero-space Focused Programs	2	0	0
Aero-Space Base	2	2	2
Commercial Technology Program	15	16	16
Aero-Space Technology Mission Support	1	5	5
SAFETY AND MISSION ASSURANCE	<u>6</u>	<u>8</u>	<u>8</u>
Safety and Mission Assurance	6	8	8
 Total full-time equivalents (FTEs)	 <u>2,929</u>	 <u>3,306</u>	 <u>3,021</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

JOHN F. KENNEDY SPACE CENTER

ROLES AND MISSIONS

SPACE STATION - The Kennedy Space Center (KSC) is a supporting center for the Space Station Program. The KSC has developed a set of facilities, systems, and capabilities to conduct the operations of the Space Station. KSC develops launch site operations capabilities for conducting pre-launch and post-landing ground operations including integrated testing, interface verification, servicing, launch activities, and experiment-to rack physical integration. The KSC provides launch site logistics support, re-supply, and customer utilization. The KSC serves as the primary agent for management and integration of ground processes for all U.S. launched International Space Station (ISS) elements from manufacture and assembly through verification and launch. The KSC develops and maintains ISS flight systems expertise to support the ISS on-orbit mission and retains technical and operational experience within NASA and KSC for ground processing and verification of space flight hardware for follow-on programs.

SPACE SHUTTLE - KSC will provide the technical expertise and services for Space Shuttle processing, launch and landing operations, and program integrated logistics. This includes Shuttle element processing; SRM/SRB element buildup; Shuttle element and payload integration; and operation and maintenance of the Shuttle processing, launch, and landing facilities, systems, associated technical infrastructure, and Ground Support Equipment (GSE).

PAYLOAD CARRIERS AND SUPPORT - KSC is the Lead Center for the Payload Carriers and Support Program. KSC provides technical expertise, facilities and capabilities to perform payload buildup, test and checkout, integration and servicing of multiple payloads; development, operation, logistics and maintenance of GSE; transportation of payloads and supporting equipment to the Space Shuttle; and integration and installation of the payloads into the Space Shuttle. The KSC develops, activates, operates, and maintains the Payload Carrier facility system, GSE, and processes to enable efficient launch site processing of carriers and payloads.

EXPENDABLE LAUNCH VEHICLES - KSC will provide government insight/oversight of all launch vehicle and payload processing and checkout activities for all NASA contracted expendable launch vehicle and upper stage launch services both at KSC and the Vandenberg Air Force Base.

CENTER MANAGEMENT AND OPERATIONS - KSC will provide administrative and financial services in support of Center management and will provide for the operation and maintenance of the institutional facilities, systems, laboratories, test beds, associated technical infrastructure, and equipment. These functions are distributed under Institutional Support across the different Enterprises. KSC's Base Operations and Support Contract was re-competed recently as a joint NASA/U.S. Air Force contract that

was awarded to Space Gateway Support. The jointly managed NASA/Air Force contract provides base operation services for KSC, 45th Space Wing and the Cape Canaveral Air Force Station including building and structure maintenance, roads and grounds, medical, security, fire protection, and a wide variety of other mission support. Kennedy also coordinates the development of the agency relocation policy and manages the NASA relocation contract which facilitates the sale and purchase of homes for employees that are transferred between centers. They are also the Lead Center for Occupational Health, and for NASA's Drug Free Workplace Program.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
JOHN F. KENNEDY SPACE CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>1,635</u>	<u>1,718</u>	<u>1,723</u>
International Space Station	309	317	317
Space Flight Operations (Space Shuttle)	640	669	688
Payload & ELV Support	202	226	226
Investment - HEDS	91	89	90
HEDS Mission Support	393	407	392
HEDS Reimbursable Activities	0	10	10
SPACE SCIENCE	<u>8</u>	<u>9</u>	<u>13</u>
Space Science Mission Support	8	9	13
BIOLOGICAL & PHYSICAL RESEARCH	<u>12</u>	<u>17</u>	<u>18</u>
Biological & Physical Research	12	17	18
AERO-SPACE TECHNOLOGY	<u>74</u>	<u>70</u>	<u>70</u>
Aero-space Focused Programs	24	24	24
Commercial Technology Program	20	20	20
Aero-Space Technology Mission Support	30	26	26
SAFETY AND MISSION ASSURANCE	<u>11</u>	<u>11</u>	<u>11</u>
Safety and Mission Assurance	11	11	11
 Total full-time equivalents (FTEs)	 <u>1,740</u>	 <u>1,825</u>	 <u>1,835</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

GEORGE C. MARSHALL SPACE FLIGHT CENTER

ROLES AND MISSIONS

SPACE PROPULSION - As NASA's designated Center of Excellence for Space Propulsion, the Marshall Space Flight Center (MSFC) leads the Agency's efforts in development, implementation and advocacy of advanced Earth-to-orbit and in-space propulsion systems and technologies. MSFC has responsibility for research, technology maturation, design, development, and integration of space transportation and propulsion systems. This includes both reusable space transportation systems for Earth-to-orbit applications, as well as vehicles for orbital transfer and deep space transportation.

SPACE TRANSPORTATION - MSFC has responsibility for research, technology maturation, design, development, and integration of space transportation and propulsion systems. This includes both reusable space transportation systems for Earth-to-orbit applications, as well as vehicles for orbital transfer and deep space transportation. MSFC is the lead Center for the Space Launch Initiative, with the goal—by the 2005 time frame—of enabling full-scale development of commercially competitive, privately owned and operated, Earth -to-orbit Reusable Launch Vehicles (RLVs). The objective will be to dramatically improve safety while significantly reducing the cost of launch services.

SPACE SHUTTLE ELEMENTS - MSFC's Space Shuttle projects manage safe, continuous, robust, and cost-effective operations for the Space Shuttle propulsion elements: External Tank, Solid Rocket Booster, Reusable Solid Rocket Motor, and Space Shuttle Main Engine. MSFC continues to streamline operations and aggressively develop and implement significant upgrades to enhance safety, meet the manifest, improve mission supportability, and improve the system to sustain the Space Shuttle for its lifetime.

INTERNATIONAL SPACE STATION (ISS) - MSFC supports the ISS program through task agreements with the ISS Program Office at the Johnson Space Center (JSC). MSFC plays a vital role in building, operating, and utilizing the ISS for NASA through the performance of these tasks. Specifically, MSFC provides management oversight of Nodes 2 and 3, which will be provided by the Italian Space Agency and their contractor, Alenia. The purpose of these sections of the United States On-Orbit Segment is to act as a building block to connect utilities, and provide a pressurized passageway between berthed elements. Commands and data will be distributed/transferred, as well as audio, video, electrical power, thermal energy, atmosphere, and water. MSFC has also provided management oversight of the Interim Control Module being built by the Naval Research Laboratory, and the United States Propulsion System (USPS). The USPS incorporates a propulsion module and a Node 4 docking module element. MSFC is responsible for the development of the regenerative life support systems for the ISS crew and the research animals. MSFC's Testing, Manufacturing and Support Team will provide technical expertise to ISS design and development teams. MSFC is also responsible for the management, integration and execution of payload operations and utilization activities on board the ISS.

SPACE SCIENCE RESEARCH - MSFC is responsible for managing the overall design, development, integration, test, and flight operations of the Gravity Probe-B (GP-B) flight experiment. The GP-B objective is to test two extraordinary predictions of Einstein's Theory of General Relativity, namely "geodetic precession" and "frame dragging," both of which describe distortions in the space-time continuum. MSFC also manages the Solar B and the GLAST Burst Monitor, and conducts fundamental research in six disciplines—cosmic-ray physics, gamma-ray astronomy, x-ray astronomy, solar physics, space plasma physics and astrobiology. MSFC manages the operation of the MSFC developed Chandra X-ray Observatory through the Operations Control Center and the Chandra X-ray Center at the Smithsonian Astrophysical Observatory in Cambridge, MA.

SPACE OPTICS MANUFACTURING TECHNOLOGY - MSFC leads the Agency in the development of lightweight, large-aperture Space Optics Manufacturing Technology for use in achieving the mission goals of NASA's strategic enterprises.

EARTH SCIENCE - Through the Global Hydrology and Climate Center (GHCC), a joint venture with academia, MSFC engages in research, education, and the development of Earth science applications. The GHCC focuses on using advanced technology to observe and understand the global climate system and applies this knowledge to agriculture, urban planning, water resource management, and operational meteorology.

OFFICE OF BIOLOGICAL AND PHYSICAL RESEARCH - MSFC is responsible for implementing the Agency's microgravity initiatives through the Microgravity Research and Space Product Development programs. MSFC's efforts enable scientific and commercial researchers the unique opportunity to use the low gravity environment of space as a catalyst to generate new knowledge, products, and services that improve the quality of life on earth. MSFC is also responsible for implementing the Materials Science and Biotechnology Science disciplines and the Glovebox Program within the Microgravity Research Program.

NATIONAL SPACE SCIENCE AND TECHNOLOGY CENTER - The National Space Science and Technology Center (NSSTC), headquartered in Huntsville, Alabama, is a research and education institution that provides an environment for selected key scientific disciplines. It consists of researchers and resources from government, academia and industry collaborating in an environment that enables cutting edge basic and applied research and fosters education of the next generation of scientists and engineers. The NSSTC is a partnership between NASA and the State of Alabama through the Alabama Space Science & Technology Alliance (SSTA) to perform research meeting the nation's needs.

AGENCY SUPPORT ACTIVITIES - A broad range of personnel, facilities, and operational support services are required to support Agency functions assigned to MSFC. MSFC has responsibility for the following Agency support activities: Communications Architecture and Providing Agency WAN Services; NASA Automated Data Processing Consolidation Center; NASA Digital Television Transition; NASA Integrated Service Network; NASA Preferred Technical Standards Program; NASA Acquisition Internet Service; NASA Operational Environment Team; National Center for Advanced Manufacturing; NASA Engineering Infrastructure; Earned-Value Management; Defense Contract Administrative Service Financial Management Support; Integrated Financial Management Program Core Financial Project; and the Integrated Financial Management Program Integration Project. The IFM Core Financial Project provides the management and technical leadership for the Agency-wide implementation of a standard financial system and processes necessary to support NASA's financial management activities. The first of several potential IFM projects, Core Financial

will provide the backbone of the IFM Program and consists of the following components: standard general ledger, accounts receivable, accounts payable, budget execution, purchasing, fixed assets, project accounting, and cost allocation. MSFC manages the project and will serve as the pilot center for implementation of the core financial software.

CENTER MANAGEMENT AND OPERATIONS – MSFC provides administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems and equipment. These functions are distributed under Institutional Support across the different Enterprises.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
GEORGE C. MARSHALL SPACE FLIGHT CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>1,506</u>	<u>1,655</u>	<u>1,700</u>
International Space Station	689	696	678
Space Operations (SOMO)	10	10	10
Space Flight Operations (Space Shuttle)	320	401	426
Payload & ELV Support	8	22	32
Investment - HEDS	264	268	267
HEDS Mission Support	215	258	287
SPACE SCIENCE	<u>220</u>	<u>199</u>	<u>183</u>
Major Development Programs	10	23	19
Payload Program	10	11	11
Operating Missions	2	2	2
Research and Technology	165	130	122
Space Science Mission Support	33	33	29
BIOLOGICAL & PHYSICAL RESEARCH	<u>103</u>	<u>110</u>	<u>110</u>
Biological & Physical Research	89	92	90
Biological & Physical Research Mission Support	14	18	20
EARTH SCIENCE	<u>57</u>	<u>51</u>	<u>50</u>
Earth Observing System Program	3	3	3
Research and Technology	39	37	37
Earth Science Mission Support	6	9	8
ES Reimbursable Activities	9	2	2
AERO-SPACE TECHNOLOGY	<u>666</u>	<u>720</u>	<u>719</u>
Aero-space Focused Programs	279	416	370
Aero-space Base	253	133	179
Commercial Technology Program	33	27	27
Code R New Initiatives	8	8	8
Space Base Program	0	16	14
Aero-Space Technology Mission Support	93	120	121

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
GEORGE C. MARSHALL SPACE FLIGHT CENTER (continued)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
SAFETY AND MISSION ASSURANCE	<u>24</u>	<u>23</u>	<u>23</u>
Safety and Mission Assurance	13	12	12
ACADEMIC PROGRAMS	11	11	11
Total full-time equivalents (FTEs)	<u>2,576</u>	<u>2,758</u>	<u>2,785</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

JOHN C. STENNIS SPACE CENTER

ROLES AND MISSIONS

HUMAN SPACE FLIGHT - As the Lead Center for Propulsion Testing, SSC will operate, maintain, and manage a propulsion test capability that includes test facilities at JSC/WSTF, MSFC and GRC/Plum Brook and related systems for development, certification, and acceptance of rocket propulsion systems and components. The Center will provide, maintain, and manage the facilities and the related capabilities required for the continued development and acceptance testing of the Space Shuttle Main Engines. SSC will also maintain and support the Center's technical core laboratory and operations to enable SSC to conduct advanced propulsion test technology research and development for government and commercial propulsion programs.

EARTH SCIENCE - Through the Commercial Remote Sensing Program, SSC will enhance U.S. economic competitiveness via commercial partnership programs that apply remote sensing technologies in business applications and reduce new product development costs. As part of the Applied Research and Data Analysis program, SSC will conduct fundamental and applied research which increases our understanding of environmental systems sciences, with emphasis on coastal research of both land and oceans.

AERONAUTICAL RESEARCH AND TECHNOLOGY - Through the Technology Transfer and Small Business Innovative Research programs, SSC will broaden and accelerate the development of spin-off technologies derived from national investments in aerospace research. SSC will also support the development of new and innovative propulsion technologies through the Advanced Space Transportation Program that supports the Agency goal of reducing the cost of access to space.

CENTER MANAGEMENT AND OPERATIONS - SSC provides administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. The Center will provide, operate, maintain, and manage the institutional base and laboratories required to support NASA programs, Commercial programs, and other Federal and State agencies and organizations resident at the SSC. These functions are distributed under Institutional Support across the different Enterprises.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
STENNIS SPACE CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>136</u>	<u>142</u>	<u>161</u>
International Space Station	21	21	22
Investment - HEDS	54	55	55
HEDS Mission Support	61	46	64
HEDS Reimbursable Activities	0	20	20
EARTH SCIENCE	<u>52</u>	<u>48</u>	<u>47</u>
Earth Observing System Program	0	0	1
Research and Technology	28	28	27
Earth Science Mission Support	24	20	19
AERO-SPACE TECHNOLOGY	<u>72</u>	<u>71</u>	<u>68</u>
Aero-space Focused Programs	19	24	21
Aero-space Base	17	14	16
Commercial Technology Program	4	4	4
Aero-Space Technology Mission Support	32	29	27
SAFETY AND MISSION ASSURANCE	<u>1</u>	<u>1</u>	<u>1</u>
Safety and Mission Assurance	1	1	1
ACADEMIC PROGRAMS	<u>11</u>	<u>18</u>	<u>23</u>
 Total full-time equivalents (FTEs)	 <u>272</u>	 <u>280</u>	 <u>300</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2001 ESTIMATES

GODDARD SPACE FLIGHT CENTER

ROLES AND MISSIONS

SPACE SHUTTLE/PAYLOAD AND UTILIZATION OPERATIONS - GSFC manages flights of the Hitchhiker, a reusable carrier system which provides increased flight opportunities with reduced leadtime while maximizing Space Shuttle load factors and minimizing spaceflight costs. GSFC also manages and coordinates the Agency's Get Away Special (GAS) program.

SPACE SCIENCE - GSFC manages physics and astronomy activities in the following discipline areas: gamma ray astronomy, X-ray astronomy, ultraviolet and optical astronomy, infrared and radio astronomy, particle astrophysics, solar physics, interplanetary physics, planetary magnetospheres, and astrochemistry. GSFC is also responsible for conducting the mission operations for a variety of operating spacecraft. Other activities include managing NASA's sounding rocket and scientific balloon program.

GSFC also conducts planetary exploration research into the physics of interplanetary and planetary space environments. Participates in planetary mission instrument development, operations, and data analysis. GSFC develops technologies targeted at improved spaceborne instruments, and on-board spacecraft systems and subsystems.

EARTH SCIENCE - Lead Center for Earth Science, including the Earth Observing System (EOS). The primary objective of the EOS is to record global change and to observe regional-to-global processes. The EOS will document global change over a 15-year period to provide long-term, consistent data sets for use in modeling and understanding global processes. This process and modeling research effort will provide the basis for establishing predictive global change models for policy makers and scientists.

Manages Earth Probes and New Millennium flight projects; and manages, on a reimbursable basis, the acquisition of meteorological observing spacecraft for the National Oceanic and Atmospheric Administration (NOAA). Conducts science correlation measurements from balloons, sounding rockets, aircraft, and ground installations.

Lead Center for the Independent Verification & Validation (IV&V) Facility in Fairmont, West Virginia. The IV&V Facility is responsible for providing independent assessments of project software and for the management of all software IV&V efforts within the Agency.

AERONAUTICAL RESEARCH AND TECHNOLOGY - The Wallops Flight Facility provides institutional and technical support to Langley Research Center, other NASA Centers, and commercial users who conduct flight studies of new approach and landing procedures using the latest in guidance equipment and techniques, pilot information displays, human factors data, and terminal area navigation. As an integral partner in the Agency's High Performance Computing and Communications (HPCC) program, GSFC leads an effort to enhance the infusion of HPCC technologies into the Earth community through the provision of advanced computer architectures and communication technologies. Promotes private sector investment in space-based technologies through the transfer of technologies that derive from NASA's programs and activities.

MISSION/SPACE COMMUNICATION SERVICES - Research and technology involves the investigation and development of advanced systems and techniques for spacecraft communications and tracking, command and control, and data acquisition and processing. The primary objectives are to apply technology and develop advanced capabilities to meet the tracking and data processing requirements of new missions and to improve the cost effectiveness and reliability of flight mission support.

Although the Johnson Space Center is designated as the Space Operations Lead Center, GSFC manages a number of critical program elements, including operation of the Tracking and Data Relay Satellite System (TDRSS); the development of the replenishment TDRSS spacecraft; mission control, data processing, and orbit/attitude computation support; operating the Space Tracking and Data Network (STDN), the NASA Communications (NASCOM) Network, and the Aeronautics, Balloons and Sounding Rocket Program.

The NASCOM Network links the stations of the Deep Space Network (DSN), STDN, TDRSS, and other tracking and data acquisition elements with control centers and data processing and computation centers.

CENTER MANAGEMENT AND OPERATIONS - Provides administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. These functions are distributed under Institutional Support across the different Enterprises. GSFC also performs the following activities for NASA Headquarters: Logistics and transportation support; financial management and all accounting services; procurement support for contracts, grants and cooperative agreements required by Headquarters offices; training and development services; and processing of unsolicited proposals received for review by Headquarters.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
GODDARD SPACE FLIGHT CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>453</u>	<u>467</u>	<u>460</u>
International Space Station	1	0	0
Space Operations (SOMO)	236	236	234
Space Flight Operations (Space Shuttle)	8	8	8
Payload & ELV Support	59	58	61
Investment - HEDS	0	1	0
HEDS Mission Support	149	164	157
SPACE SCIENCE	<u>1,441</u>	<u>1,539</u>	<u>1,620</u>
Major Development Programs	249	229	200
Payloads Program	28	20	19
Explorer Program	176	179	184
Mars Surveyor Program	10	23	27
Discovery Program	8	10	9
Operating Missions	0	0	0
Research and Technology	501	590	627
Space Science Mission Support	469	488	554
BIOLOGICAL & PHYSICAL RESEARCH	<u>0</u>	<u>0</u>	<u>0</u>
B&PR Mission Support	0	0	0
EARTH SCIENCE	<u>1,305</u>	<u>1,199</u>	<u>1,129</u>
Earth Observing System Program	384	375	363
Earth Probes Program	139	72	53
Operating Missions	29	27	22
Research and Technology	241	224	227
Earth Science Mission Support	426	422	387
ES Reimbursable Activities	86	79	77

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
GODDARD SPACE FLIGHT CENTER (continued)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
AERO-SPACE TECHNOLOGY	<u>72</u>	<u>94</u>	<u>95</u>
High Speed Research Program	1	0	0
Advanced Subsonics Tech Program	2	0	0
Aero-Space Base	4	10	14
Commercial Technology Program	44	48	47
Aero-Space Technology Mission Support	21	36	34
SAFETY AND MISSION ASSURANCE	<u>12</u>	<u>7</u>	<u>7</u>
Safety and Mission Assurance	12	7	7
ACADEMIC PROGRAMS	<u>5</u>	<u>5</u>	<u>5</u>
 Total full-time equivalents (FTEs)	 <u>3,288</u>	 <u>3,311</u>	 <u>3,316</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

AMES RESEARCH CENTER

ROLES AND MISSIONS

AERO-SPACE TECHNOLOGY – Ames Research Center (ARC) is the lead for integrative research in information technology, biotechnology and nanotechnology towards applications in NASA's missions. ARC conducts research in aerospace operations automation technologies and modeling with an emphasis on enhancing National Airspace capacity and safety. ARC conducts aerospace vehicle research and technology development associated with autonomy and integrated vehicle health management. ARC conducts research and technology development that supports life cycle risk management and the associated knowledge management systems. ARC provides leadership for high end computing and networking within the Agency. ARC provides high-fidelity flight simulations to support national goals in aviation safety and capacity, as well as aerospace vehicle development requirements. ARC conducts research on advanced thermal protection systems and performs arcjet testing to meet national needs for access to space and planetary exploration. ARC emphasizes joint research and technology projects with academia, industry and other government agencies in order to apply the best talent of the nation to NASA's mission requirements.

SPACE SCIENCE – ARC has the Agency lead role in Astrobiology (the study of life in the universe) which focuses on the origin, adaptation, and destiny of life in the universe. Research includes advanced laboratory and computation facilities for astrochemistry; planetary atmosphere modeling, including relationships to the atmosphere of the Earth; the formation of stars and planetary systems; and an infrared technology program to investigate the nature and evolution of astronomical systems. Development continues of the Stratospheric Observatory for Infrared Astronomy (SOFIA) for research to be conducted by various NASA/university teams. Research and development in advanced information technologies are directed toward significantly increasing the efficiency of SOFIA as it becomes operational. ARC is the lead Center for information technology efforts in the cross-enterprise spacecraft technology program.

LIFE AND MICROGRAVITY SCIENCE - ARC has the Agency lead role in Fundamental Biology program and the Biomolecular Systems Research program. These synergistic programs examine the adaptation of life forms to reduced gravity and the biotechnology which supports this scientific pursuit. Research continues into the effects of gravity on living systems using spaceflight experiments, ground simulation, and hypergravity facilities to understand how gravity affects the development, structure, and functions of living systems. Development continues on the Space Station Biological Research Project, the key life science facility aboard the International Space Station. Also studied are options for preventing problems in crew health and psychophysiology during and after extended spaceflight. ARC has a primary focus on advanced physical/chemical technologies for life support, including research into all aspects of regenerative life support. Research is conducted in the areas of ecosystems and health monitoring.

EARTH SCIENCE - ARC builds instruments and computer models for the measurement and analysis of atmospheric constituents and properties from aircraft platform are being developed. Applied research and developments to enhance the use of remote and in-situ sensing technology for Earth resources applications continues. ARC provides information systems and high end computing support for Earth Sciences knowledge acquisition.

SAFETY AND MISSION ASSURANCE - Provide institutional safety and health programs and develop and integrate Safety and Mission Assurance guidelines into program and project development. ARC has created a Systems Management function to assist programs and projects in their initial development phase to ensure their successful implementation.

CENTER MANAGEMENT AND OPERATIONS - Provide administrative and financial services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. ARC is ISO 9001 certified. These functions are distributed under Institutional Support across the different Enterprises.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
AMES RESEARCH CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>87</u>	<u>89</u>	<u>119</u>
International Space Station	64	67	97
Space Flight Operations (Space Shuttle)	1	0	0
HEDS Mission Support	22	22	22
SPACE SCIENCE	<u>288</u>	<u>195</u>	<u>194</u>
Major Development Programs	54	49	38
Mars Surveyor Program	11	11	9
Research and Technology	150	87	99
Space Science Mission Support	73	48	48
BIOLOGICAL & PHYSICAL RESEARCH	<u>82</u>	<u>81</u>	<u>77</u>
Biological & Physical Research	60	59	59
B&PR Mission Support	22	22	18
EARTH SCIENCE	<u>74</u>	<u>73</u>	<u>73</u>
Research and Technology	56	55	55
Earth Science Mission Support	18	18	18
AERO-SPACE TECHNOLOGY	<u>908</u>	<u>1,015</u>	<u>1,012</u>
Aero-space Focused Programs	229	225	223
Aero-Space Base	440	401	355
Commercial Technology Program	17	16	16
Space Base Program	0	56	75
Aero-Space Technology Mission Support	222	317	343
SAFETY AND MISSION ASSURANCE	<u>3</u>	<u>2</u>	<u>2</u>
Safety and Mission Assurance	3	2	2
ACADEMIC PROGRAMS	<u>9</u>	<u>9</u>	<u>9</u>
 Total full-time equivalents (FTEs)	 <u>1,451</u>	 <u>1,464</u>	 <u>1,486</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

DRYDEN FLIGHT RESEARCH CENTER

CENTER ROLES AND MISSIONS

AEROSPACE TECHNOLOGY - Develop, manage, and maintain facilities and test bed aircraft to support safe, timely, and cost effective NASA flight research and to support industry, university, and other government agency flight programs.

Conceive, formulate, and conduct piloted and unpiloted research programs in disciplinary technology, integrated aeronautical systems, and advanced concepts to meet current and future missions throughout subsonic, supersonic, and hypersonic flight regimes.

Conduct flight research programs in cooperation with other NASA Installations, other government agencies, the aerospace industry, and universities. Provides for the timely transition of results, techniques, methods, and tools to industry and government users.

DFRC will also provide flight test support for atmospheric tests of experimental or developmental launch systems, including reusable systems.

INTERNATIONAL SPACE STATION - Conduct technology development and flight test of a X-38 prototype emergency Crew Return Vehicle (CRV), provide on-orbit tracking and communications through Western Aeronautical Test Range (WATR).

SPACE SHUTTLE /PAYLOAD AND UTILIZATION OPERATIONS AND SPACE MANAGEMENT OPERATIONS OFFICE (SOMO) - Provide operational and technical support for the conduct of Space Shuttle missions, including on-orbit tracking and communications (WATR), landing support of crew and science requirements.

EARTH SCIENCE - Conduct flight operations in support of Airborne Science Missions utilizing aircraft for data collection and observation.

CENTER MANAGEMENT AND OPERATIONS - Provides administrative services in support of Center management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. These functions are distributed under Institutional Support across the different Enterprises.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
DRYGEN FLIGHT RESEARCH CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>76</u>	<u>62</u>	<u>133</u>
International Space Station	33	33	103
Space Operations (SOMO)	19	9	10
Space Flight Operations (Space Shuttle)	4	4	4
HEDS Mission Support	20	16	16
EARTH SCIENCE	<u>38</u>	<u>37</u>	<u>38</u>
Research and Technology	29	29	29
Earth Science Mission Support	9	8	9
AERO-SPACE TECHNOLOGY	<u>500</u>	<u>533</u>	<u>435</u>
Aero-space Focused Programs	79	172	95
Aero-Space Base	289	224	202
Commercial Technology Program	3	3	3
Aero-Space Technology Mission Support	129	134	135
SAFETY AND MISSION ASSURANCE	<u>1</u>	<u>1</u>	<u>1</u>
Safety and Mission Assurance	1	1	1
ACADEMIC PROGRAMS	<u>2</u>	<u>2</u>	<u>2</u>
 Total full-time equivalents (FTEs)	 <u>617</u>	 <u>635</u>	 <u>609</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATE

LANGLEY RESEARCH CENTER

ROLES AND MISSIONS

AERO-SPACE RESEARCH AND TECHNOLOGY - Conduct advanced research in fundamental airframe systems technologies including aerodynamics; high-speed, highly maneuverable aircraft; hypersonic propulsion; guidance and controls; acoustics; and structures and materials. Develop a technology base for improving transport, fighter, general aviation, and commuter aircraft. Conduct an aeronautical research and technology program to study current and future technology requirements and to demonstrate technology applications. Conduct theoretical and experimental research in fluid and flight mechanics to determine aerodynamic flows and complex aircraft motions.

Initiate a new vehicle research thrust to explore advanced vehicle concepts and revolutionary new technologies to enable the development of advanced 21st Century Air Vehicles. Conduct research to develop new technologies such as advanced aeroelastically tailored materials, new structural concepts, embedded sensors, intelligent systems, and microactuators. Employ advanced analysis methods to combine these new technologies to develop innovative new airframe systems with improved safety, reduced emissions and noise, increased capacity, and reduced cost per seat mile for commercial transport and general aviation aircraft. Conduct control and guidance research programs to advance technology in aircraft guidance and navigation, aircraft control systems, cockpit systems integration and interfacing techniques, and performance validation and verification methods. Provide Agencywide leadership and strategically maintain or increase the Agency's preeminent position in structures and materials by serving as the NASA Center of Excellence for Structures and Materials.

Conduct aeronautics and space research and technology development for airframe systems to advance aerospace transportation systems, including hypersonic aircraft, missiles, and space access vehicles using airbreathing and rocket propulsion. Conduct research to develop airframe technologies and capabilities for next generation reusable launch vehicles and to develop aeroassist technologies and capabilities to enable safer and more affordable spacecraft. Specific technology discipline areas of expertise are aerodynamics, aerothermodynamics, structures, materials, hypersonic propulsion, guidance and controls, and systems analysis. Conduct long-range studies directed at defining the technology requirements for advanced transportation systems and missions. Develop technology options for realization of practical hypersonic and transatmospheric flight.

EARTH SCIENCE - Perform an Agency-designated Atmospheric Science mission role in support of the Earth Science Enterprise in the NASA Strategic Plan. As Lead Center for Focused Atmospheric Science Missions, conduct a world-class peer reviewed and selected atmospheric science program in support of national goals in preserving the environment and in fundamental science. Specific discipline areas of expertise are Earth radiation research, particularly the role of clouds in the Earth's energy budget; middle and upper atmospheric research; and tropospheric research. Perform innovative scientific research to advance the

knowledge of atmospheric radioactive, chemical, and dynamic processes for understanding global change; develop innovative passive and active sensor systems concepts for atmospheric science measurements. Conduct a technology development program that develops advanced laser and LIDAR technologies for Earth science missions; advanced passive remote sensing technologies; develop advanced ultra-lightweight and adaptive materials, structural systems technologies, and analytical tools for significantly reducing the end-to-end cost and increasing the performance of earth observation space instruments and systems. Conduct an Application and Educational Outreach program that utilizes scientific data for non-scientific applications and in support of science and math education. Serve as a Primary Data Analysis and Archival Center (DAAC) for Earth Radiation and Atmospheric Chemistry for the Earth Observing System.

SPACE SCIENCES - Support the solicitation and selection process of the Office of Space Science's (OSS) Discovery, Explorer, and Solar Terrestrial Probes Programs; conduct reviews of candidate and selected missions and independent assessments of on-going space science missions to help ensure that OSS criteria for high quality science return within cost and schedule constraints are met. Conduct a technology development program for advanced ultra-lightweight and adaptive materials, structural systems technologies, and analytical tools for significantly reducing the end-to-end cost and increasing the performance of space science instruments and systems. Continue studies and selected technology development for future planetary atmospheric flight vehicles including aeroshells, airplanes, gliders, etc. Develop active and passive sensor technologies and concepts for application in planetary atmospheric studies. Selectively develop laser, LIDAR, and passive sensor technologies and perform research for planetary studies in areas which are related to our Earth Science role. LaRC has provided and continues to provide analysis of spacecraft aerodynamics, aerothermodynamics, and flight dynamics for spacecraft entering planetary atmospheres (including Earth) in support of both spacecraft design and flight operations. LaRC is also responsible for the design and development of the Earth Entry Vehicle technology flight demonstration for the Mars Sample Return Mission currently scheduled for test in 2006.

LIFE AND MICROGRAVITY SCIENCES - Conduct space radiation exposure studies and develop/upgrade analysis tools and new materials in support of current and future human space efforts for a more accurate assessment of astronaut radiation exposures and body shielding factors.

HUMAN EXPLORATION AND DEVELOPMENT OF SPACE - Support the Human Exploration and Development of Space through systems analyses of Space Station evolution and future human space exploration missions.

SYSTEMS ANALYSIS/INDEPENDENT PROGRAM EVALUATION AND ASSESSMENT - Serve as the Agency lead Center for systems analysis and the conduct of independent evaluation, assessment, and cost estimation of Agency programs. Maintain, as a Center core competency, appropriate expertise and analysis tools to support the Agency's Strategic Enterprises in the definition and development of advanced systems concepts to achieve NASA's goals. Utilize core systems analysis capabilities (supplemented with expertise from other Centers as appropriate) to support the Office of the Administrator by conducting independent assessments of advanced concepts and proposed new systems to validate conceptual level designs prior to Agency commitment to major developmental funding. Provide Agency-wide independent cost estimates and analysis for programs and projects. Support the Administrator's Program Management Council (PMC) in the organization, administration, and technical support of PMC review process.

CENTER MANAGEMENT AND OPERATIONS - Provide for the safety and security of the Center workforce and for the safe operation and maintenance of the institutional facilities, systems, and equipment. Provide administrative and financial services in support of Center management. These functions are distributed under Institutional Support across the different Enterprises. Langley also is the lead for the Independent Program Analysis Office (including cost assessments) for the entire agency.

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
LANGLEY RESEARCH CENTER

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>49</u>	<u>25</u>	<u>59</u>
International Space Station	30	21	55
Payload & ELV Support	11	0	0
HEDS Mission Support	8	4	4
SPACE SCIENCE	<u>143</u>	<u>87</u>	<u>101</u>
Major Development Programs	15	1	0
Payloads Program	4	1	1
Mars Surveyor Program	35	53	61
Discovery Program	7	6	11
Operating Missions	5	0	0
Research and Technology	53	9	10
Space Science Mission Support	24	17	17
BIOLOGICAL & PHYSICAL RESEARCH	<u>0</u>	<u>3</u>	<u>3</u>
Biological & Physical Research	0	3	3
B&PR Mission Support	0	0	0
EARTH SCIENCE	<u>351</u>	<u>307</u>	<u>304</u>
Earth Observing System Program	75	46	42
Earth Probes Program	13	27	23
Operating Missions	1	6	6
Research and Technology	203	170	178
Earth Science Mission Support	59	57	56
AERO-SPACE TECHNOLOGY	<u>1,813</u>	<u>1,943</u>	<u>1,866</u>
Aero-space Focused Programs	449	534	452
Aero-Space Base	883	926	948
Commercial Technology Program	42	61	66
Code R New Initiative	130	0	0
Space Base Program	0	63	50
Aero-Space Technology Mission Support	309	359	350

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
LANGLEY RESEARCH CENER (continued)

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
SAFETY AND MISSION ASSURANCE	<u>4</u>	<u>32</u>	<u>32</u>
Safety and Mission Assurance	4	32	32
Total full-time equivalents (FTEs)	<u>2,360</u>	<u>2,396</u>	<u>2,364</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

GLENN RESEARCH CENTER at LEWIS FIELD

ROLES AND MISSIONS

LIFE AND MICROGRAVITY SCIENCES - The Glenn Research Center (GRC) provides leadership and management of the fluid physics, combustion science, and acceleration measurement disciplines of NASA's Microgravity Science Program. Sponsors and conducts ground-based scientific studies that may lead to experiments in space. GRC has a substantial effort in the design, buildup, testing, integration, and telescience operations of hardware for experiments to be launched aboard the Space Shuttle and the utilization of the Space Station for scientific missions.

SPACE STATION - GRC support to the space station program includes technical and management support in the areas of power and on-board propulsion components and system, engineering and analysis, technical expertise, and testing for components and systems. This includes use of facilities and testbeds and construction of flight hardware as required.

MISSION COMMUNICATIONS SERVICES - GRC develops and demonstrates communications and networks technologies in relevant environments to enhance the performance of existing mission services or enable new services. The Center identifies and infuses new capabilities at higher frequencies (Ka-band and above) into the next generation of spacecraft and communications satellites, to enable seamless interoperability between NASA assets and commercial space and ground networks. The Center also ensures timely and high quality availability of radio frequency spectrum to enable the realization of NASA goals.

AERONAUTICAL RESEARCH AND TECHNOLOGY - As the NASA Lead Center for Aeropropulsion, GRC conducts world-class research critical to the Agency Aerospace Technology Enterprise goals of developing and transferring enabling technologies to U.S. Industry and other government agencies. The Center's Aeropropulsion programs are essential to achieving National goals to promote economic growth and national security through safe, superior, and environmentally compatible U.S. civil and military aircraft propulsion systems.

AEROSPACE PROPULSION AND POWER - The Aerospace Propulsion and Power Base R&T Program provides a foundation for the broad range of technologies needed for a steady influx of concepts available for use by the U.S. aerospace industry through the future years. It supports the Enterprise goals by providing a foundation to enable the following:

- Develop advanced technology concepts and methodologies for application by industry;
- Build foundation for focused programs to address selected national needs;
- Respond quickly to critical safety and other issues; and
- Provide facilities and expert consultation for industry during their product development

The Aerospace Propulsion and Power Base R&T program spans subsonic, supersonic, hypersonic, general aviation, high performance aircraft, and access-to-space propulsion systems through research in combustion, turbomachinery, materials and structures, internal fluid dynamics, instrumentation and controls, interdisciplinary technologies, and aircraft icing.

Another Lead-Center program, Ultra-Efficient Engine Technology, is planned and designed to develop high-payoff, high-risk technologies to enable the next breakthroughs in propulsion systems to spawn a new generation of high performance, operationally efficient and economical, reliable and environmentally compatible U.S. aircraft. The breakthrough technologies are focused on propulsion component and high temperature engine materials development and demonstrations enabling future commercial and military propulsion systems which are greatly simplified, achieve higher performance, and have potential for much reduced environmental impact with a broad range of aircraft application.

GRC has research expertise in world-class facilities critical to ensuring U.S. leadership in aviation. The FAA, EPA, and DOD in particular depend on NASA GRC research for advancement in emissions, noise, engine performance, and new materials.

NASA Center of Excellence in Turbomachinery GRC's expertise in Turbomachinery is critical to advancing the Agency's goals in the aeronautics and space programs. This enables GRC to be a cost-effective resource across multiple Agency programs in the vital and strategic discipline area of turbomachinery. Turbomachinery based areas of expertise include air breathing propulsion and power systems, primary and auxiliary propulsion and power systems, on-board propulsion systems, and rotating machinery for the pumping of fuels/propellants.

CENTER MANAGEMENT AND OPERATIONS - Provides administrative and financial services in support of Center Management and provides for the operation and maintenance of the institutional facilities, systems, and equipment. These functions are distributed under Institutional Support across the different Enterprises

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
GLENN RESEARCH CENTER at LEWIS FIELD

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>323</u>	<u>349</u>	<u>441</u>
International Space Station	207	213	286
Space Operations (SOMO)	48	56	61
HEDS Mission Support	68	80	94
SPACE SCIENCE	<u>217</u>	<u>15</u>	<u>16</u>
Research and Technology	169	12	12
Space Science Mission Support	48	3	4
BIOLOGICAL & PHYSICAL RESEARCH	<u>149</u>	<u>118</u>	<u>108</u>
Biological & Physical Research	115	93	84
B&PR Mission Support	34	25	24
EARTH SCIENCE	<u>1</u>	<u>3</u>	<u>3</u>
Research and Technology	1	3	3
AERO-SPACE TECHNOLOGY	<u>1,265</u>	<u>1,475</u>	<u>1,341</u>
Aero-space Focused Programs	294	361	315
Aero-Space Base	694	627	578
Commercial Technology Program	27	24	24
Space Base Program	0	178	153
Investment - AST	10	9	9
Aero-Space Technology Mission Support	240	276	262
SAFETY AND MISSION ASSURANCE	<u>15</u>	<u>13</u>	<u>13</u>
Safety and Mission Assurance	15	13	13
 Total full-time equivalents (FTEs)	 <u>1,970</u>	 <u>1,973</u>	 <u>1,922</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

RESEARCH AND PROGRAM MANAGEMENT

FISCAL YEAR 2002 ESTIMATES

NASA HEADQUARTERS

ROLES AND MISSIONS

NASA Corporate Headquarters

MISSION - The mission of Headquarters is to plan and provide executive direction for the implementation of U. S. space exploration, space science, Earth science, aeronautics, and technology programs. This includes corporate policy development, program formulation, resource allocations, program performance assessment, long-term institutional investments, and external advocacy for all of NASA.

MAJOR CORPORATE ROLES - At NASA Headquarters, the broad framework for program formulation will be conducted through five Strategic Enterprises: Human Exploration and Development of Space, Earth Science, Aerospace Technology, Biological and Physical Research, and Space Science. Consistent with the NASA strategic plan, the Strategic Enterprises develop program goals and objectives to meet the needs of external customers within the policy priorities of the Administration and Congress.

Corporate level enabling processes and staff functions will provide cross-cutting interfaces required to support the Strategic Enterprises in legislative affairs, public affairs, budget and financial management, equal opportunity programs, human resources, education, legal affairs, procurement, international affairs, management systems and facilities, information systems and technology, small business, safety and mission quality, advisory committees, and policy and plans. These functions are distributed under Institutional Support across the different Enterprises

DISTRIBUTION OF FULL-TIME EQUIVALENT (FTE) WORKYEARS BY PROGRAM
NASA HEADQUARTERS

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
HUMAN EXPLORATION & DEVELOPMENT OF SPACE	<u>403</u>	<u>457</u>	<u>496</u>
HEDS Mission Support	403	457	496
SPACE SCIENCE	<u>127</u>	<u>117</u>	<u>127</u>
Space Science Mission Support	127	117	127
BIOLOGICAL & PHYSICAL RESEARCH	<u>29</u>	<u>32</u>	<u>35</u>
B&PR Mission Support	29	32	35
EARTH SCIENCE	<u>98</u>	<u>96</u>	<u>92</u>
Earth Science Mission Support	98	96	92
AERO-SPACE TECHNOLOGY	<u>323</u>	<u>361</u>	<u>404</u>
Aero-Space Technology Mission Support	323	361	404
Total full-time equivalents (FTEs)	<u>980</u>	<u>1,063</u>	<u>1,154</u>

Note: Staffing distribution for FY 2001 and FY 2002 is under review in response to cost growth on the Space Station Program and the need for management reforms. Civil Service workforce distribution is being assessed to focus on agency priorities, and the numbers provided may be subject to change

The allocation of FTEs for Mission Support at Headquarters is determined by a formula based on the proportion of total civil service FTEs associated with each Enterprise across all NASA Centers. The numbers above do not reflect the number of direct FTEs at NASA Headquarters in each of the Enterprise offices since the function of HQ personnel is considered to be "corporate" in nature, supporting the entire Agency. The derivation for these FTEs is similarly used to distribute the cost of the NASA Headquarters civil servants to the Enterprises.

DETAIL OF PERMANENT POSITIONS

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Executive level II	1	1	1
Executive level IV	<u>1</u>	<u>2</u>	<u>2</u>
Subtotal	2	3	3
ES-6	36	41	46
ES-5	67	90	95
ES-4	120	146	151
ES-3	47	75	80
ES-2	57	75	65
ES-1	<u>66</u>	<u>78</u>	<u>68</u>
Subtotal	393	505	505
CA	1	1	1
SL/ST	62	62	62
GS-15	2,544	2,566	2,566
GS-14	3,698	3,743	3,743
GS-13	5,662	5,745	5,745
GS-12	1,762	1,793	1,793
GS-11	1,284	1,303	1,303
GS-10	214	217	217
GS-9	507	525	535
GS-8	282	298	298
GS-7	654	676	666
GS-6	419	422	422
GS-5	85	89	89
GS-4	30	32	32
GS-3	4	2	2
GS-2	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal	17,208	17,474	17,474
Special ungraded positions established by NASA Administrator	22	26	26
Ungraded positions	<u>229</u>	<u>229</u>	<u>229</u>
Total permanent positions	<u>17,854</u>	<u>18,237</u>	<u>18,237</u>
Unfilled positions, EOY	<u>0</u>	<u>0</u>	<u>0</u>
Total, permanent employment, EOY	<u>17,854</u>	<u>18,237</u>	<u>18,237</u>

PERSONNEL SUMMARY

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
Average GS/GM grade	12.57	12.54	12.53
Average ES salary	\$126,046	\$128,693	\$131,396
Average GS/GM salary	\$70,016	\$72,956	\$76,021
Average salary of special ungraded positions established by NASA Administrator	\$88,277	\$91,985	\$95,848
Average salary of ungraded positions	\$47,554	\$49,551	\$51,632

CENTER LOCATIONS AND CAPITAL INVESTMENT

JOHNSON SPACE CENTER - The Lyndon B. Johnson Space Center is located 20 miles southeast of Houston, Texas. NASA owns 1,581 acres of land at the Houston site and uses another 60,552 at the White Sands Test Facility, Las Cruces, New Mexico. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets was \$2,337,142 as of September 30, 2000.

KENNEDY SPACE CENTER - The Kennedy Space Center is located 50 miles east of Orlando, Florida. NASA owns 82,943 acres and uses launch facilities at Cape Canaveral Air Station and Vandenberg Air Force Base. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets was \$1,759,599 as of September 30, 2000.

MARSHALL SPACE FLIGHT CENTER - The Marshall Space Flight Center is located within the U.S. Army's Redstone Arsenal at Huntsville, Alabama. MSFC also manages operation at the Michoud Assembly 15 miles east of New Orleans, Louisiana and the Slidell Computer Complex in Slidell, Louisiana. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets was \$2,941,841 as of September 30, 2000.

STENNIS SPACE CENTER - The Stennis Space Center is located approximately 50 miles northeast of New Orleans, Louisiana. NASA owns 20,663 acres and has easements covering an additional 118,284 acres. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets was \$467,857 as of September 30, 2000.

GODDARD SPACE FLIGHT CENTER - The Goddard Space Flight Center is located 15 miles northeast of Washington, D.C. at Greenbelt, Maryland. NASA owns 1,121 acres at this location and an additional 6,176 acres at the Wallops Flight Facility in Wallops Island, Virginia. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets at both locations was \$1,818,345 as of September 30, 2000.

AMES RESEARCH CENTER - The Ames Research Center is located south of San Francisco on Moffett Field, California. NASA owns 447.5 acres at the Moffett Field location. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets at both locations was \$1,044,818 as of September 30, 2000.

DRYDEN FLIGHT RESEARCH CENTER - The Dryden Flight Research Center is 65 air miles northeast of Los Angeles. Dryden is located at the north end of Edwards Air Force Base on 838 acres of land under a permit from the Air Force. The total capital investment at Dryden, including fixed assets in progress and contractor-held facilities at various locations, as of September 30, 2000 was \$1,283,196.

LANGLEY RESEARCH CENTER - The Langley Research Center is adjacent to Langley Air Force Base which is located between Williamsburg and Norfolk at Hampton, Virginia. NASA owns 788 acres and has access to 3,276 acres. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets was \$1,024,116 as of September 30, 2000.

GLENN RESEARCH CENTER - The Lewis Research Center occupies two sites; the main site is in Cleveland, Ohio, adjacent to Cleveland-Hopkins Airport; the second site is the Plum Brook Station located south of Sandusky, Ohio, and 50 miles west of Cleveland. NASA owns 6,805 acres and leases an additional 14 acres at the Cleveland location. The total capital investment including land, buildings, structures and facilities, equipment, and other fixed assets at both locations was \$648,089 as September 30, 2000.

NASA HEADQUARTERS - NASA Headquarters is located at Two Independence Square, 300 E St. SW, Washington, D.C. and occupies other buildings in the District of Columbia, Maryland, and Virginia.